SiQi Zhou

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Research Interests

The goal of my research is to develop the mathematical foundation and algorithmic tools that enable robots to safely and efficiently perform versatile tasks in dynamic and unstructured environments. My research interests include safe learning-based control for robotics, neural networks, control theory, and multiagent systems.

Education

Ph.D. in Aerospace Science and Engineering (CGPA: 4.0/4.0) 09/2016 – 11/2022
Dynamic Systems Lab, Institute for Aerospace Studies, University of Toronto
Other affiliations: Vector Institute for Artificial Intelligence; University of Toronto Robotics Institute
Advisor: Prof. Angela P. Schoellig

B.A.Sc. in Engineering Science (with High Honours, CGPA: 3.94/4.00) 09/2011 – 06/2016
Division of Engineering Science, University of Toronto
Major in Aerospace Engineering, Minor in Robotics and Mechatronics

Awards, Scholarships, and Recognitions

Marie Skłodowska-Curie Actions (MSCA) Postdoctoral Fellowship, European Union 06/2024–05/2026
A postdoctoral fellowship targeted at supporting talented researchers to establish collaborative research and innovation projects both within and beyond the European Union (success rate 15.8%)

RSS Pioneers 06/2022
One of the 30 top graduate students selected to participate in the RSS Pioneers Workshop (35% acceptance rate)

MIT Rising Stars in Aerospace 05/2021
One of the 35 top graduate students selected to participate in the MIT Rising Stars Workshop

Alexander Graham Bell Canada Graduate Scholarship ($105,000 CAD), NSERC 05/2018 – 05/2021
Full doctoral research support (ranked 6 out of 133 preselected applications in Computing Sciences)

People's Choice Award in Three-Minute Thesis Competition, UofT Robotics Institute 11/2020
Best presentation chosen by the attendees

Dean's Honour List (for every semester), UofT Division of Engineering Science 09/2011 – 06/2016
Full academic load with an average of individual sessions above 80%

The 2016 Award of Excellence, UofT Division of Engineering Science 04/2016
CGPA of first 7 academic sessions above 3.90 (one of the 14 recipients out of 200 students)

Undergraduate Student Research Award ($6,000 CAD), NSERC 05/2014 – 08/2014
Undergraduate research scholarship

Undergraduate Student Research Award ($6,000 CAD), NSERC 05/2013 – 08/2013

Undergraduate research scholarship

John Macara, Barrister of Goderich, Scholarship ($1,500 CAD), UofT 09/2012
Scholarship in recognition of academic excellence

External Awards ($750 CAD), UofT 11/2011
Award in recognition of academic excellence

Toronto and Area Road Builders Association Scholarship, UofT ($2,000 CAD) 10/2011
Scholarship in recognition of academic excellence

University of Toronto Scholar ($5,000 CAD, UofT) 09/2011
University entrance award

Contributions

A complete list of publications can be found on my Google Scholar profile. The lists below are sorted in chronological order. My name is in bold, the students I supervise are underlined, and equal distribution is indicated by an asterisk (*) after the respective names.

Journal Articles

[1] **S. Zhou**, L. Brunke, A. Tao, A. W. Hall, F. Pizarro Bejarano, and A. P. Schoellig, "What is the impact of releasing code With publications? Statistics from the machine learning, robotics, and control communities," *IEEE Control Systems Magazine*, vol. 44, no. 4, pp. 38-46, 2024, doi: 10.1109/MCS.2024.3402888. [pdf]

[2] L. Brunke, **S. Zhou**, and A. P. Schoellig, "Learning probabilistic control invariance conditions for input-constrained uncertain nonlinear control systems," *IEEE Control Systems Letters (L-CSS)*, vol. 8, pp. 157-162, 2024, doi: 10.1109/LCSYS.2023.3344138. [pdf]

[3] X. Du, **S. Zhou**, and A. P. Schoellig, "Hierarchical task model predictive control for sequential mobile manipulation tasks," *IEEE Robotics and Automation Letters (RA-L)*, vol. 9, no. 2, pp. 1270-1277, 2024, doi: 10.1109/LRA.2023.3342671. [pdf]

[4] Z. Yuan, A. W. Hall, **S. Zhou**, L. Brunke, M. Greeff, J. Panerati, and A. P. Schoellig, "`safe-control-gym`: A unified benchmark suite for safe learning-based control and reinforcement learning," *IEEE Robotics and Automation Letters (RA-L)*, vol. 7, no. 4, pp. 11142-11149, 2022, doi: 10.1109/LRA.2022.3196132. [pdf]

[5] M. Greeff, **S. Zhou**, and A. P. Schoellig, "Fly out the window: exploiting discrete-time flatness for fast vision-based multirotor flight," *IEEE Robotics and Automation Letters (RA-L)*, vol. 7, no. 2, pp. 5023-5030, 2022, doi: 10.1109/LRA.2022.3154008. [pdf]

[6] **S. Zhou**, K. Pereida, W. Zhao, and A. P. Schoellig, "Bridging the model-reality gap with Lipschitz network adaptation," *IEEE Robotics and Automation Letters (RA-L)*, vol. 7, no. 1, pp. 642-649, 2022, doi: 10.1109/LRA.2021.3131698. [pdf]

[7] L. Brunke*, M. Greeff*, A. W. Hall*, Z. Yuan*, **S. Zhou***, J. Panerati, and A. P. Schoellig, "Safe learning in robotics: From learning-based control to safe reinforcement learning," *Annual Review of Control, Robotics, and Autonomous Systems*, vol. 5, no. 1, pp. 411-444, 2022, doi: 10.1146/annurev-control-042920-020211. [pdf]

[8] **S. Zhou**, M. K. Helwa, and A. P. Schoellig, "Deep neural networks as add-on modules for enhancing robot performance in impromptu trajectory tracking," *International Journal of Robotics Research (IJRR)*, vol. 39, no. 12, pp. 1397-1418, 2020, doi: 10.1177/0278364920953902. [pdf]

[9] M. J. Sorocky, **S. Zhou**, and A. P. Schoellig, "To share or not to share? Performance guarantees and the asymmetric nature of cross-robot experience transfer," *IEEE Control Systems Letters (L-CSS)*, vol. 5, no. 3, pp. 923-928, 2020, doi: 10.1109/LCSYS.2020.3005886. [pdf]

[10] **S. Zhou**, M. K. Helwa, and A. P. Schoellig, "An inversion-based learning approach for improving impromptu trajectory tracking of robots with non-minimum phase dynamics," *IEEE Robotics and Automation Letters (RA-L)*, vol. 3, no. 3, pp. 1663-1670, 2018, doi: 10.1109/LRA.2018.2801471. [pdf]

Conference Papers

[1] **S. Zhou**, S. Papatheodorou, S. Leutenegger, and A. P. Schoellig, "Control-barrier-aided teleoperation with Visual-Inertial SLAM for safe MAV navigation in complex environments," in *Proc. of the IEEE International Conference on Robotics and Automation (ICRA)*, 2024, pp. 17 836–17 842, doi: 10.1109/ICRA57147.2024.10611280. [pdf]

[2] J. Qian, **S. Zhou**, N. J. Ren, V. Chatrath, and A. P. Schoellig, "Closing the perception-action loop for semantically safe navigation in semi-static environments," in *Proc. of the IEEE International Conference on Robotics and Automation (ICRA)*, 2024, pp. 11 641–11 648, doi: 10.1109/ICRA57147.2024.10610267. [pdf]

[3] V. K. Adajania, **S. Zhou**, A. K. Singh, and A. P. Schoellig, "AMSwarmX: Safe swarm coordination in CompleX environments via implicit non-convex decomposition of the obstacle-free space," in *Proc. of the IEEE International Conference on Robotics and Automation (ICRA)*, 2024, pp. 14 555–14 561, doi: 10.1109/ICRA57147.2024.10610428. [pdf]

[4] L. Brunke, **S. Zhou**, M. Che, and A. P. Schoellig, "Practical considerations for discrete-time implementations of continuous-time control barrier function-based safety filters," in *Proc. of the American Control Conference (ACC)*, 2024, accepted. [pdf]

[5] R. Römer, L. Brunke, **S. Zhou**, and A. P. Schoellig, "Is data all that matters? The role of control frequency for learning-based sampled-data control of uncertain systems," in *Proc. of the American Control Conference (ACC)*, 2024, accepted. [pdf]

[6] V. K. Adajania, **S. Zhou**, A. K. Singh, and A. P. Schoellig, "AMSwarm: An alternating minimization approach for safe motion planning of quadrotor swarms in cluttered environments," in *Proc. of the IEEE International Conference on Robotics and Automation (ICRA)*, 2023, pp. 1421–1427, doi: 10.1109/ICRA48891.2023.10161063. [pdf]

[7] L. Brunke, **S. Zhou**, and A. P. Schoellig, "Robust predictive output-feedback safety filter for uncertain nonlinear control systems," in *Proc. of the IEEE Conference on Decision and Control (CDC)*, 2022, pp. 3051-3058, doi: 10.1109/CDC51059.2022.9992834. [pdf]

[8] L. Brunke*, **S. Zhou***, and A. P. Schoellig, "Barrier Bayesian linear regression: Online learning of control barrier conditions for safety-critical control of uncertain systems," in *Proc. of the Annual Learning for Dynamics and Control Conference (L4DC)*, 2022, pp. 168:881-892. [pdf]

[9] L. Brunke, **S. Zhou**, and A. P. Schoellig, "RLO-MPC: Robust learning-based output feedback MPC for improving the performance of uncertain systems in iterative tasks," in *Proc. of the IEEE Conference on Decision and Control (CDC)*, 2021, pp. 2183–2190, doi: 10.1109/CDC45484.2021.9682940. [pdf]

[10] J. Panerati, H. Zheng, **S. Zhou**, J. Xu, A. Prorok, and A. P. Schoellig, "Learning to fly: A Gym environment with PyBullet physics for reinforcement learning of multi-agent quadcopter control," in *Proc. of the IEEE International Conference on Intelligent Robots and Systems (IROS)*, 2021, pp. 7489–7496, doi: 10.1109/IROS51168.2021.9635857. [pdf]

[11] M. J. Sorocky*, **S. Zhou***, and A. P. Schoellig, "Experience selection using dynamics similarity for efficient multi-source transfer learning between robots," in *Proc. of the IEEE International Conference on Robotics and Automation (ICRA)*, 2020, pp. 2739–2745, doi: 10.1109/ICRA40945.2020.9196744. [pdf]

[12] **S. Zhou** and A. P. Schoellig, "Active training trajectory generation for inverse dynamics model learning with deep neural networks," in *Proc. of the IEEE Conference on Decision and Control (CDC)*, 2019, pp. 1784–1790, doi: 10.1109/CDC40024.2019.9029973. [pdf]

[13] **S. Zhou**, A. Sarabakha, E. Kayacan, M. K. Helwa, and A. P. Schoellig, "Knowledge transfer between robots with similar dynamics for high-accuracy impromptu trajectory tracking," in *Proc. of the European Control Conference (ECC)*, 2019, pp. 1-8, doi: 10.23919/ECC.2019.8796140. [pdf]

[14] **S. Zhou**, M. K. Helwa, and A. P. Schoellig, "Design of deep neural networks as add-on blocks for improving impromptu trajectory tracking," in *Proc. of the IEEE Conference on Decision and Control (CDC)*, 2017, pp. 5201-5207, doi: 10.1109/CDC.2017.8264430. [pdf]

Extended Abstracts

[1] A. Jiao, T. P. Patel, S. Khurana, A. Korol, L. Brunke, Vivek K. Adajania, U. Culha, **S. Zhou**, and A. P. Schoellig, "Swarm-GPT: Combining large language models with safe motion planning for robot choreography design," in *Proc. of the Conference on Neural Information Processing Systems (NeurIPS) Robot Learning Workshop: Pretraining, Fine-Tuning, and Generalization with Large Scale Models*, 2023. [pdf]

[2] **S. Zhou**, A. Sarabakha, E. Kayacan, M. K. Helwa, and A. P. Schoellig, "Knowledge transfer between robots with online learning for enhancing robot performance in impromptu trajectory tracking," in *Proc. of the IEEE International Conference on Robotics and Automation (ICRA) Resilient Robot Teams Workshop*, 2019. [pdf]

[3] **S. Zhou**, M. K. Helwa, and A. P. Schoellig, "Deep neural networks as add-on modules for high- accuracy impromptu trajectory tracking," in *Proc. of the Conference on Robot Learning (CoRL)*, 2017. [pdf]

[4] **S. Zhou**, "A comparison of probabilistic population code and sampling-based code in neural state estimations," in *Proc. of the Conference on Cognitive Computational Neuroscience (CCN)*, 2017. [pdf]

Other Contributions

[1] M. J. Sorocky*, **S. Zhou***, and A. P. Schoellig, "Experience selection using dynamics similarity for efficient transfer learning between robots," *Vector Institute Research Symposium*, 2021.

[2] **S. Zhou** and A. P. Schoellig, "Deep neural networks for robot control," *UofT Robotics Institute 3MT Competition*, 2020. Received the *People's Choice Award*.

[3] ——, "Deep neural networks for robot control," *NSERC Canada Robotics Network Annual Meeting*, 2020.

[4] **S. Zhou**, A. Sarabakha, E. Kayacan, M. K. Helwa, and A. P. Schoellig, "Knowledge transfer between robots for high-accuracy impromptu trajectory tracking," *Vector Institute Research Symposium*, 2019.

[5] **S. Zhou** and A. P. Schoellig, "Learning inverse dynamics with neural networks for enhancing robot performance in impromptu trajectory tracking," *Pan-Can. Self-Organizing Conf. on Machine Learning*, 2019.

[6] **S. Zhou**, A. Sarabakha, E. Kayacan, M. K. Helwa, and A. P. Schoellig, "Transferring deep inverse models across robots for high-accuracy impromptu trajectory tracking," *Intl. Aerial Robotics Research Symp.*, 2019.

[7] **S. Zhou**, M. K. Helwa, and A. P. Schoellig, "High-accuracy impromptu trajectory tracking with deep neural networks," *CIFAR Deep Learning Reinforcement Learning (DLRL) Summer School*, 2018.

[8] ——, "High-accuracy impromptu trajectory tracking with deep neural networks," *International Aerial Robotics Research Symposium*, 2017.

[9] **S. Zhou**, B. A. Francis, and A. P. Schoellig, "Transformation between kinematic point and unicycle model for leader-follower formation problems," *Undergraduate Engineering Research Day (UnERD)*, 2014.

Invited Talks and Lectures

- **Robotics: Science and System Conference Workshop**, Delft, Netherlands 07/2024
  Invited talk at the Robotics: Science and System Conference (RSS) Workshop on Aerial Swarm Tools and Applications (on behalf of Prof. A. Schoellig). Title: "Safe decision-making for aerial swarms: From reliable localization to efficient coordination."
- **European Robotics Forum Workshop**, Rimini, Italy 03/2024
  Invited talk at the European Robotics Forum Workshop, Towards Efficient and Portable Robot Learning for Real-World Settings (on behalf of Prof. A. Schoellig). Title: "Safe and efficient robot learning in the real world."
- **University of Bristol**, Bristol, England 07/2023
  Invited talk at the University of Bristol Dynamics and Control Research Seminar. Title: "Integrating machine learning and control theory for safe and efficient robot decision making."
- **Vector Institute for Artificial Intelligence**, Toronto, Canada 06/2022
  Invited talk at the Vector Institute Endless Summer School for Trustworthy AI. Title: "Integrating machine learning and control theory for safe and efficient robot decision making."
- **Vector Institute for Artificial Intelligence**, Toronto, Canada 04/2022
  Guest lecture for the Safe Learning in Robotics Workshop. Title: "Reinforcement learning tutorial."
- **University of Toronto**, Toronto, Canada 03/2022
  Guest lecture for "SCS3253: Machine Learning." Title: "Integrating machine learning and control theory for safe and efficient robot decision making."
- **University of Toronto Robotics Institute**, Toronto, Canada 02/2022
  Invited talk at the Toronto AI in Robotics Seminar. Title: "Integrating machine learning and control theory for safe and efficient robot decision making."
- **Queen's University**, Kingston, Canada 02/2022
  Invited talk at the ECE Department Research Seminar. Title: "Integrating machine learning and control theory for safe and efficient robot decision making."
- **Vector Institute for Artificial Intelligence**, Toronto, Canada 01/2022
  Invited talk at the Vector Institute Talk Series. Title: "Integrating machine learning and control theory for safe and efficient robot decision making."
- **University of California San Diego**, San Diego, USA 11/2021
  Guest lecture for "MAE207: Safety for Autonomous Systems" instructed by Prof. Sylvia Herbert. Title: "Safe learning in robotics: from learning-based control to safe reinforcement learning." Co-presenters: Angela Schoellig, Lukas Brunke, Melissa Greeff, Adam Hall, Jacopo Panerati, and Zhaocong Yuan.

Successful Funding Proposals

I have contributed to the following grant proposals. These grants were awarded by the Technical University of Munich, the University of Toronto, the European Union, and the Natural Sciences and Engineering Research Council of Canada (NSERC).

- **TUM GNI Project** (four fully-funded PhD positions), Technical University of Munich 2024 – 2028
  "Computational design and fabrication of self-supporting VAULTed structures through AI-driven human-robot cooperation." Principal Investigators: Prof. Pierluigi D'Acunto, Prof. Kathrin Dörfler, Prof. Stefan Leutenegger, and Prof. Angela Schoellig.
- **Marie Skłodowska-Curie Actions (MSCA) Postdoctoral Fellowship** (€173K), European Union 2024 – 2026
  "Deployable decision-making: embracing semantics for robotic safety in everyday scenarios." Principal Investigator: Prof. Angela Schoellig. Researcher: Dr. SiQi Zhou.
- **MIRMI Seed Fund** (six-month funding for two PhD positions), Technical University of Munich 2022 – 2023
  "Learning-aided real-world semantic exploration." Principal Investigators: Prof. Stefan Leutenegger and Prof. Angela Schoellig.
- **CARTE Seed Funding** ($120K), University of Toronto 2020 – 2022
  "Giving robots a sense of touch: safe, high-performance robot manipulation combining novel skin-like sensors with high-rate, learning-based feedback control." Principal Investigator: Prof. Angela Schoellig. Co-applicant: Prof. Xinyu Liu.
- **Collaborative Research and Development Grant** ($274K), NSERC 2019 – 2022
  "Networked drones for concrete structure, environmental, and radiation surveys." Principal Investigator: Prof. Angela Schoellig. Co-applicants: Prof. Doug Hooton, Prof. Karl Peterson, and Ontario Power Generation (OPG).
- **Research Tools and Instruments Grant** ($150K), NSERC 2018 – 2022
  "The University of Toronto Robotics Innovation Garage: a collaborative space for interdisciplinary research in mobile robotics." Principal Investigator: Prof. Angela Schoellig. Co-applicants: Prof. Kamran Esmaeili, Prof. Brenda McCabe, and Prof. Mireille Broucke.

Student Supervision

PhD Students

- Xintong Du, Ph.D. Thesis, Aerospace Engineering, UofT 09/2020 – 09/2024
- Lukas Brunke, Ph.D. Thesis, Aerospace Engineering, UofT 09/2020 – 09/2024

Master Students

- Christopher Biel, M.Sc. Thesis, Robotics, Cognition, Intelligence (RCI), TUM 04/2024 – 10/2024
- Yanni Zhang, M.Sc. Thesis, Electrical Engineering, TUM 02/2024 – 08/2024
- Mingxuan Che, M.Sc. Thesis, Mechanical Engineering, TUM 01/2023 – 07/2024
- Nicoló Musolesi, M.Sc. Thesis (external), ECE, Università di Bologna 10/2023 – 03/2024
- Ben Sprenger, M.Sc. Thesis (external), Mechanical and Process Engineering, ETH Zürich 09/2023 – 03/2023
- Ralf Römer, M.Sc. Thesis, Electrical Engineering, TUM 04/2023 – 10/2023
- Vivek Adajania, M.A.Sc. Thesis, Aerospace Engineering, UofT 09/2021 – 05/2022
- Michael Sorocky, M.A.Sc. Thesis, Aerospace Engineering, UofT 09/2018 – 10/2020

Bachelor Students

- Orrin Dahanaggamaarachchi, B.A.Sc. PEY Internship, Engineering Science, UofT 05/2024 – 04/2025
- Christina, B.Sc. Summer Research, Computer Science, Princeton 05/2024 – 09/2024
- Gordan Tan, B.A.Sc. Summer Research, Engineering Science, UofT 05/2024 – 09/2024

- Zoe Kutulakos, B.A.Sc. Summer Research, Engineering Science, UofT 05/2024 – 09/2024
- Ken Kato, B.A.Sc. Summer Research, Engineering Science, UofT 05/2024 – 09/2024
- Aoran Jiao, B.A.Sc. Summer Research, Engineering Science, UofT 05/2023 – 09/2023
- Anna-Mariya Korol, B.A.Sc. Summer Research, Engineering Science, UofT 05/2023 – 09/2023
- Tanmay Patel, B.A.Sc. Summer Research, Engineering Science, UofT 05/2023 – 09/2023
- Sanjmi Khurana, B.A.Sc. Summer Research, Engineering Science, UofT 05/2023 – 09/2023
- Nicholas Ren, B.Sc. Summer Research, Computer Science, Waterloo 05/2022 – 09/2022
- Allen Tao, B.A.Sc. Summer Research, Engineering Science, UofT 05/2021 – 09/2021
- James Xu, B.A.Sc. Summer Research, Engineering Science, UofT 05/2020 – 09/2020
- Dhruv Sirohi, B.A.Sc. Summer Research, Engineering Science, UofT 05/2020 – 09/2020
- Hshmat Sahak, B.A.Sc. Summer Research, Engineering Science, UofT 05/2020 – 09/2020

Teaching Experience

Teaching Assistant, University of Toronto 09/2016 – 05/2022

Robotics Courses

- **AER1517 Control for Robotics** (Spring 2020 and 2022)
  A graduate course introducing optimal control and reinforcement learning techniques for robot decision-making. Enrollment: 23 students. This course was first offered in Spring 2020. My responsibilities included curriculum development, creating assignments, compiling course notes, developing a benchmark repository for course projects, and grading assignments. Instructor: Prof. Angela Schoellig.
- **AER1513 State Estimation for Aerospace Vehicles** (Fall 2018)
  A graduate course introducing practical state estimation techniques (e.g., unscented Kalman filtering and particle filtering). Enrollment: 43 students. My responsibilities included grading assignments as well as providing feedback on the course projects. Instructor: Prof. Steven Waslander.
- **ECE470 Robot Modeling and Control** (Fall 2017 and 2021)
  An EngSci/ECE technical elective course introducing modeling, planning and control techniques for robot manipulators. Enrollment: approximately 70 students. My responsibilities included teaching practical sessions and grading exams. Instructor: Prof. Mireille Broucke.
- **ROB310 Mathematics for Robotics** (Fall 2020 and 2021)
  An EngSci course introducing fundamental mathematics tools for robotics. Enrollment: between 50-70 students. My responsibilities included marking weekly assignments and exams, addressing questions from the students, and drafting exam questions. Instructors: Prof. Angela Schoellig and Prof. Tim Barfoot.

Control Courses

- **ECE1643 Stochastic Control, Safety Analysis, and Reinforcement Learning** (Spring 2021)
  A graduate course covering mathematical background and state-of-the-art literature on safety analysis and reinforcement learning for stochastic systems. Enrollment: 8 students. I was responsible for grading paper critiques and providing feedback on course project proposals. Instructor: Prof. Margaret Chapman.
- **ECE557 Linear Systems Control** (Fall 2018-2021)
  A graduate/undergraduate course on state-space linear control techniques. Enrollment: approximately 70 students. My responsibilities included teaching practical sessions and grading lab reports and exams. Instructors: Prof. Manfredi Maggiore and Prof. Margaret Chapman.

- **AER372 Control Systems** (Spring 2018-2020)
  An EngSci introductory control course on frequency domain control design techniques. Enrollment: between 55-80 students. I was responsible for marking assignments and exams as well as drafting exam questions in a particular year. Instructors: Prof. Tim Barfoot, Prof. Hugh Liu, and Prof. Reza Emami.
- **ECE311 Introduction to Control Systems** (Spring 2019-2021)
  An ECE undergraduate course on frequency domain control design techniques. Enrollment: approximately 100 students. I was responsible for teaching practical sessions and grading exams. Instructors: Prof. Mireille Broucke and Prof. Manfredi Maggiore.

Other Courses

- **AER210 Vector Calculus and Fluid Mechanics** (Fall 2016)
  An EngSci course covering fundamentals of integral and vector calculus and providing an introduction to continuum fluid mechanics. Enrollment: approximately 200 students. I supervised approximately 100 students in flow visualization labs. Instructor: Prof. James Davis.
- **MAT290 Advanced Engineering Mathematics** (Fall 2016-2017)
  An ECE undergraduate course on complex analysis and ordinary differential equations. Enrollment: 320-360 students. I was responsible for grading weekly quizzes and exams. Instructor: Prof. Adrian Nachman.

Organizing Experience

I have co-organized eight workshops and one competition at major robotics, control, and machine learning conferences. These include the Conference on Robot Learning (CoRL), the Robotics: Science and Systems Conference (RSS), the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), the IEEE International Conference on Robotics and Automation (ICRA), the IEEE Conference on Decision and Control (CDC), and the Conference on Neural Information Processing Systems (NeruIPS).

- **CoRL Workshop on Mastering Robot Manipulation in a World of Abundant Data** 11/2024
  Co-organizer of this workshop to be held at the 2024 Conference on Robot Learning (CoRL). Co-organizers: Prof. Angela Schoellig (TUM), Prof. Animesh Garg (Georgia Tech and NVIDIA), Dr. Karime Pereida (Kindred), Dr. Oier Mees (UCB), Ralf Römer (TUM), and Martin Schuck (TUM). [webpage]
- **RSS Workshop on Semantics for Robotics** 07/2024
  Co-organizer of this workshop held at the 2024 Robotics: Science and Systems Conference (RSS). Co-organizers: Prof. Angela Schoellig (TUM), Lukas Brunke (TUM), Jingxing Qian (UofT), Federico Pizarro Bejarano (UofT), Adam Hall (UofT), and Sepehr Samavi (UofT). [webpage]
- **CDC Workshop on Benchmarking, Reproducibility, and Open-Source Code in Controls** 12/2023
  Co-organizer of this workshop held at the 2023 IEEE Conference on Decision and Control (CDC). Co-organizers: Prof. Angela Schoellig (TUM), Prof. Jonathan How (MIT), Prof. Peter Corke (QUT), Prof. George Pappas (UPenn), Prof. Sandra Hirche (TUM), Lukas Brunke (TUM), Federico Pizarro Bejarano (UofT), Adam Hall (UofT), and Dr. Jacopo Panerati (TII). [webpage]
- **RSS Pioneers Workshop** 07/2023
  Co-general chair of this workshop held at the 2023 Robotics: Science and Systems Conference (RSS). Co-organizers: George Kontoudis (Univ. of Maryland), Lilly Chin (MIT), Aaquib Tabrez (Univ. of Colorado Boulder), Anqi Li (Univ. of Washington), Oier Mees (Univ. of Freiburg), Fanta Camara (Univ. of Leeds), Andrew Morgan (Yale Univ.), Youngwoon Lee (USC), Nelson Rosa (Univ. of Stuttgart), et al. [webpage]
- **IROS Safe Robot Learning Competition** 10/2022
  Co-organizer of this competition held at the 2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS). Co-organizers: Prof. Angela Schoellig (UofT), Jacopo Panerati (UofT), Melissa

Greeff (UofT), Prof. Davide Scaramuzza (UZH), Prof. Nicholas Roy (MIT), Prof. Vijay Kumar (UPenn), Prof. Todd Murphey (Northwestern Univ.), Prof. Sebastian Trimpe (RWTH Aachen Univ.), Prof. Mark Mueller (UCB), et al. [webpage]

- **ICRA Workshop on Releasing Robots into the Wild** 05/2022
  Co-organizer of this workshop held at the 2022 IEEE International Conference on Robotics and Automation (ICRA). Co-organizers: Prof. Angela Schoellig (UofT), Prof. Davide Scaramuzza (UZH), Adam Hall (UofT), Zhaocong Yuan (UofT), Jacopo Panerati (UofT), Lukas Brunke (UofT), and Melissa Greeff (UofT). [webpage]
- **NeurIPS Workshop on Deployable Decision Making in Embodied Systems** 12/2021
  Co-organizer of this workshop held at the 2021 Conference on Neural Information Processing Systems (NeruIPS). Co-organizers: Prof. Angela Schoellig (UofT), Prof. Animesh Garg (UofT), Prof. Somil Bansal (USC), Lukas Brunke (UofT), and Melissa Greeff (UofT). [webpage]
- **IROS Workshop on Safe Real-World Robot Autonomy** 09/2021
  Co-organizer of this workshop held at the 2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS). Co-organizers: Prof. Angela Schoellig (UofT), Prof. Animesh Garg (UofT), Prof. Somil Bansal (USC), Lukas Brunke (UofT), and Melissa Greeff (UofT). [webpage]
- **RSS Robotics for People Workshop: Perspectives on Interaction, Learning and Safety** 07/2021
  Co-organizer of this workshop held at the 2021 Robotics: Science and Systems Conference (RSS). Co-organizers: Prof. Matthew Gombolay (Georgia Tech), Shreyas Kousik (Stanford), Tesca Fitzgerald (CMU), Amir Aly (University of Plymouth), Kim Baraka (Vrije Universiteit Amsterdam), Filipa Correia (Univ. of Lisbon), Prof. Andrea Bajcsy (UCB), Prof. David Fridovich-Keil (UT Austin), Prof. Angela Schoellig (UofT), Nakul Gopalan (Georgia Tech), Ransalu Senanayake (Stanford), *et al.* [webpage]

Professional Activities

Invited Reviewer for Major Robotics and Control Venues 09/2016 – Present

IEEE Robotics and Automation Letters (RA-L), Nature, Autonomous Robots, Neurocomputing, IEEE Conference on Decision and Control (CDC), IEEE International Conference on Intelligent Robots and Systems (IROS), IEEE/RSJ International Conference on Robotics and Automation (ICRA), EUCA European Control Conference (ECC), AACC/IFAC American Control Conference (ACC), and Learning for Dynamics and Control Conference (L4DC).

Institute Outreach Events 09/2016 – Present

I was involved in different institution-level outreach events. For instance, I have given research demonstrations to over 100 visitors, including researchers, industrial partners, and prospective students, in 14 different outreach events. In addition to giving demos, I have also organized seminars and visits hosted by our lab.

Lab Administrative Tasks 09/2016 – Present

While at the Chair of Safety, Performance and Reliability for Learning Systems, led by Prof. Angela Schoellig, I am in charge of administrating the courses offered by the lab as well as leading various research projects. Previously, I also helped with hardware management, equipment purchases, and research grant applications.

Skills

- **Programming Languages:** Python, Matlab, and C/C++
- **Frameworks:** Robot Operating System (ROS) and PyTorch
- **Operating Systems:** Linux, Windows, and macOS
- **Drafting:** AutoCAD
- **Graphic Design:** Adobe Photoshop and Adobe Illustrator

- **Computational Fluid Dynamics:** OpenFoam, Tecplot, and Paraview
- **Project Management:** Microsoft Project

Personal Information

- **Citizenship:** Canadian
- **Languages (written and spoken fluently):** English and Mandarin
- **Interests:** Chess, Badminton, and Photography